

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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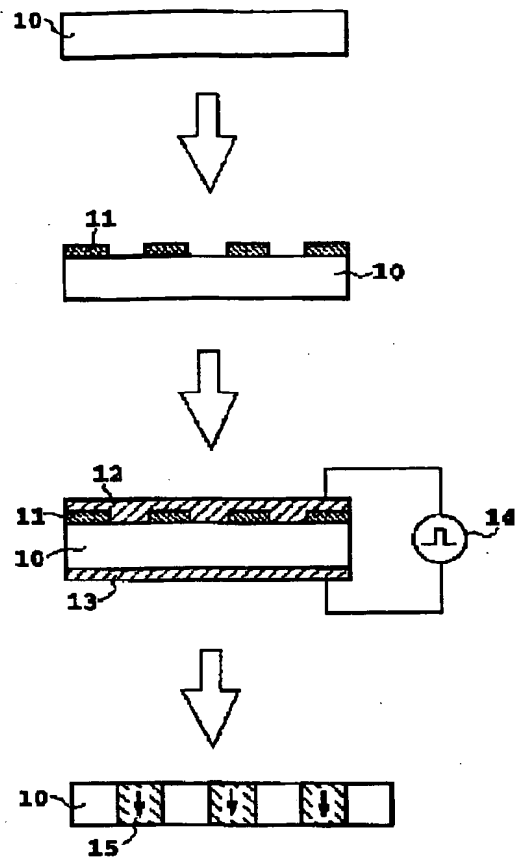
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TITLE : NONLINEAR OPTICAL ELEMENT,  
NONLINEAR OPTICAL DEVICE USING  
THE SAME AND PRODUCTION OF  
NONLINEAR OPTICAL ELEMENT



ABSTRACT : PROBLEM TO BE SOLVED: To obtain a high efficiency by making the element longer in length by using a glass member which transmits light and making the glass member have a periodical nonlinear structure produced by a polling by a pseudo-phase matching method.

SOLUTION: A periodical grating 11 designed according to a specified formula is produced from an electric insulating photoresist on one principal plane of a  $\text{GeO}_2\text{-SiO}_2$  glass material substrate 10. Then, an aluminum electrode 12 is vapor deposited on the principal plane having the grating 11. Further, an aluminum electrode 13 is also vapor deposited on the other principal plane having no grating 11. While high voltage is applied from a high voltage power supply 14 to between the electrodes 12 and 13, the side face of the substrate 10 where no aluminum electrode 12, 13 is vapor deposited is irradiated with excimer laser light. Then, by removing the remaining aluminum electrodes 12, 13 and a photoresist 11, a substrate region 15 where a secondary nonlinear effect is developed by polling is obtd.

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